

Wollaston 's JKxperiment

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ordinary electricity. By covering fine wires with glass or other insulating substances, and then removing only so much matter as to expose the point, or a section of the wires, and by passing electricity through two such wires, the guarded points of which were immersed in water, Wollaston found that the water could be decomposed even by the current from the machine, without sparks, and that two streams of gas arose from the points, exactly resembling, in appearance, those produced by voltaic electricity, and, like the latter, giving a mixture of oxygen and hydrogen gases. But Dr. Wollaston himself points out, that the effect is different from that of the voltaic pile, inasmuch as both oxygen and hydrogen are evolved from *each* pole; he calls it "a very close *imitation* of the galvanic phenomena," but adds that "in fact the resemblance is not complete," and does not trust to it to establish the principles correctly laid down in his paper.

64. This experiment is neither more nor less than a repetition, in a refined manner, of that made by Dr. Pearson in 1797,* and previously by MM. Paets Van Troostwyk and Deiman in 1789 or earlier. That the experiment should never be quoted as proving true electro-chemical decomposition, is sufficiently evident from the circumstance, that the *law* which regulates the transference and final place of the evolved bodies (14, 45) has no influence here. The water is decomposed at both poles independently of each other, and the oxygen and hydrogen evolved at the wires are the elements of the water existing the instant before in those places. That, the poles, or rather points, have no mutual decomposing dependence, may be shown by substituting a wire, or the finger, for one of them, a change which does not at all interfere with the other, though it stops all action at the changed pole. This fact may be observed by turning the machine for some time; for though bubbles will rise from the point left unaltered, in quantity sufficient to cover entirely the wire used for the other communication, if they could be applied to it, yet not a single bubble will appear on that wire.

65. When electro-chemical

decomposition takes place, there is great reason to believe that the *quantity* of matter decomposed is not proportionate to the intensity, but to the quantity of electricity passed (56). Of this I shall be able to offer some proofs in a future part of this paper (in, 113). But in the experiment under consideration, this is not the case. If, with

¹ *Nicholson's Journal*, 4to, vol. i. pp. 241, 299, 349.